

What is claimed is:

1. An apparatus for producing nanofiber utilizing electrospinning comprising:
a supply unit for supplying polymer materials of the liquid state used to produce
5 fibers;
a spinning unit having a plurality of spinning nozzles for discharging the
polymer materials supplied by the supply unit in a charged filament form;
a collector installed below the spinning unit for piling the charged filament
discharged by the spinning unit in a specific thickness; and
10 a control unit charged to have a voltage of same polarity as one of the charged
filament and positioned between the spinning unit and the collector for guiding the
stream of the charged filament in order to prevent repulsion and dispersion of the
charged filaments discharged from each spinning nozzle.
- 15 2. The apparatus according to claim 1, further comprising:
an induction unit positioned between the control unit and the collector to
surround the filament stream for inducing the charged filament stream passing through
the control unit toward the collector, a voltage of same polarity as the control unit being
applied to the induction unit.
- 20 3. The apparatus according to claim 1 or 2, further comprising a transfer mount
for reciprocating the spinning unit at a predetermined speed.

4. The apparatus according to claim 3, further comprising an air conditioning unit for inhaling air into an air layer between the spinning unit and the collector and discharging a solvent from the air layer to outside.

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5. The apparatus according to claim 4,
wherein the spinning unit includes at least one spinning nozzle pack in which the spinning nozzles are arranged in series.

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6. The apparatus according to claim 5,
wherein each spinning nozzle pack is configured so that the spinning nozzles have gradually shorter length outward from the spinning nozzle located at a center portion.

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7. The apparatus according to claim 2,
wherein the control unit is spaced apart from the adjacent spinning nozzle as much as about 1 to about 20cm.

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8. The apparatus according to claim 1, wherein the collector includes a conveyor belt rotating at a speed of about 0.1 to 30m/min.

9. The apparatus according to claim 1, wherein the collector includes a rotating

drum rotating at a speed of about 5 to 50rpm.

10. The apparatus according to claim 8 or claim 9, further comprising:

a carrier unit for carrying a piling material to which the charged filament is to be
5 adhered and which is discharged to the collector.

11. A spinning nozzle pack for forming a polymer web by electrostatically
spinning a solution used as fiber-forming material, comprising:

a body having a supplier for supplying the solution and a receiver for receiving
10 the supplied solution;

an electric connector mounted on the body to be sunk in the solution for
charging the solution when voltage is supplied thereto; and

a plurality of spinning nozzles, each having a capillary tube for discharging the
solution charged by the electric connector in a fine filament form.

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12. The spinning nozzle pack according claim 11,

wherein the spinning nozzles are configured so that lengths of the capillary tubes
are gradually short toward both sides in the longitudinal direction of the spinning nozzle
pack from the spinning nozzle located at a center portion.

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13. The spinning nozzle pack according claim 11 or 12,

wherein the body is made of engineering plastic belonging to

polyetheretherketon, fluorine series or polyamide series.

14. The spinning nozzle pack according claim 11 or 12,

wherein the electric connector is made in a shape of a conductor board or a
5 conductor stick of a predetermined length and has valleys and ridges periodically
formed along a longitudinal direction thereof, and

wherein the ridges are fit on the center of the spinning nozzles.

15. The spinning nozzle pack according claim 11 or 12, further comprising:

10 a filter installed in the receiving part for removing gelation particles and waste
materials in the charged solution.

16. The spinning nozzle pack according claim 15, further comprising:

a distribution board installed in the receiving part for regularly distributing the
15 charged solution passing through the filter toward each spinning nozzle.

17. The spinning nozzle pack according claim 11 or claim 12,

wherein the spinning nozzle can be combined in an orifice of the body frame
selectively.

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18. The spinning nozzle pack according claim 11 or 12,

wherein the spinning nozzle is made of one selected from the group consisting of

polypropylene, polyethylene, polyvinylidene fluoride, polytetrafluoroethylene series and polyetheretherketon, polyamide series, or corrosion resistance metal.

19. The spinning nozzle pack according claim 11 or 12,
5 wherein the capillary tube is integrally formed with the body.

20. The spinning nozzle pack according claim 19,
wherein the capillary tube has a tilt angle of substantially 3 to 60 degrees to a
vertical central line so as to have a shape of a circular cone in which a diameter grows
10 narrower toward a lower end thereof.

21. The spinning nozzle pack according claim 11 or 12,
wherein each capillary tube substantially has an inner diameter of 0.05 to 2mm,
an outer diameter of 0.1 to 4mm, and a length of 0.5 to 50mm.
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22. The spinning nozzle pack according claim 11,
wherein the body is capable of sealing up the receiving part, and includes a cover
in which the supply unit is provided.